



## SEQUENCE LISTING

<110> KMIEC, ERIC B.  
GAMPER, HOWARD B.  
RICE, MICHAEL C.  
USHER, MICHAEL G.

<120> GENOMICS APPLICATIONS FOR MODIFIED OLIGONUCLEOTIDES

<130> Napro-2 CON

<140> 10/672,735

<141> 2003-09-26

<150> PCT/US02/09691

<151> 2002-03-27

<150> 60/279,146

<151> 2001-03-27

<150> 60/325,828

<151> 2001-09-28

<160> 62

<170> PatentIn Ver. 3.2

<210> 1

<211> 70

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 1

ctccggccgc ttgggtggag aggctattcg gctacgactg ggcacaacag acaatcggct 60  
gctctgatgc 70

<210> 2

<211> 70

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 2

gcatcagagc agccgattgt ctgttggtgcc cagtcgtagc cgaatagcct ctccacccaa 60  
gcggccggag 70

<210> 3  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 3  
 aggctattcg gctacgactg ggcacaacag

30

<210> 4  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 4  
 ttgtgcccag tcgtagccga atagc

25

<210> 5  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(15)  
 <223> LNA monomer

<400> 5  
 gcccagtcgt agccg

15

<210> 6  
 <211> 67  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 6  
 acaactgtgt tcactagcaa cctcaaacag acaccatggg gcacctgact cctgaggaga 60  
 agtctgc 67

<210> 7  
 <211> 67  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 7  
 gcagacttct cctcaggagt caggtgcacc atggtgtctg ttgaggttg ctagtgaaca 60  
 cagttgt 67

<210> 8  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 8  
 gcagacttct cctcaggagt caggtgcacc 30

<210> 9  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 9  
 gttgcacctg actcctgagg agaagtctgc 30

<210> 10  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 10  
 gcagacttct cctcaggagt 20

<210> 11  
 <211> 25

<212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 11  
 gcagacttct cctcaggagt caggt 25

<210> 12  
 <211> 35  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 12  
 gcagacttct cctcaggagt caggtgcacc atggt 35

<210> 13  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 13  
 gcagacttct cctcaggagt caggtgcacc atggtgtctg 40

<210> 14  
 <211> 46  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 14  
 gcagacttct cctcaggagt caggtgcacc atggtgtctg tttgag 46

<210> 15  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic

## oligonucleotide

<400> 15  
 actcctgagg agaagtctgc 20

<210> 16  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 16  
 acctgactcc tgaggagaag tctgc 25

<210> 17  
 <211> 35  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 17  
 accatggtgc acctgactcc tgaggagaag tctgc 35

<210> 18  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 18  
 cagacaccat ggtgcacctg actcctgagg agaagtctgc 40

<210> 19  
 <211> 46  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 19  
 acctgactcc tgaggagaag tctgccgtta ctgccctgtg gggcaa 46

<210> 20  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 20  
 ctgttggtgcc cagtcctagc cgaatagcct 30

<210> 21  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 21  
 aggctattcg gctacgactg ggcacaacag 30

<210> 22  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 22  
 gctattcggc tacgactggg cacaa 25

<210> 23  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 23  
 attcgggtac gactgggcac 20

<210> 24  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 24

ctgttgtagc cagtcctagc cgaatagcct

30

<210> 25

<211> 25

<212> RNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<220>

<221> modified\_base

<222> (1)..(25)

<223> 2'-OMe modified

<400> 25

gcuaauucggc uacgacuggg cacaa

25

<210> 26

<211> 30

<212> RNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<220>

<221> modified\_base

<222> (1)..(30)

<223> 2'-OMe modified

<400> 26

cuguugugcc caguccuagc cgaauagccu

30

<210> 27

<211> 25

<212> RNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<220>

<221> modified\_base

<222> (1)..(25)  
 <223> 2'-OMe modified

<400> 27  
 uugugcccag ucguagccga auagc

25

<210> 28  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> misc\_feature  
 <222> (1)..(25)  
 <223> phosphorothioate linkages

<400> 28  
 ttgtgcccag tcgtagccga atagc

25

<210> 29  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(4)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (12)..(15)  
 <223> LNA monomer

<400> 29  
 gccagtcgt agccg

15

<210> 30  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide



<220>  
 <221> modified\_base  
 <222> (1)..(3)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (23)..(25)  
 <223> LNA monomer

<400> 30  
 ttgtgcccag tcgtagccga atagc

25

<210> 31  
 <211> 18  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> misc\_feature  
 <222> (1)..(18)  
 <223> PNA backbone

<400> 31  
 acgggtcagg atcggctt

18

<210> 32  
 <211> 18  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> misc\_feature  
 <222> (1)..(18)  
 <223> PNA backbone

<400> 32  
 acgggtcagg atcggctt

18

<210> 33  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic

## oligonucleotide

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)..(18)

&lt;223&gt; PNA backbone

&lt;400&gt; 33

gtgcccagtc ctagccgaat

20

&lt;210&gt; 34

&lt;211&gt; 45

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

&lt;400&gt; 34

ggtggagagg ctattcggt aggactgggc acaacagaca atcgg

45

&lt;210&gt; 35

&lt;211&gt; 19

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 35

caggggatca agatctgat

19

&lt;210&gt; 36

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Primer

&lt;400&gt; 36

gcttcagtga caacgtcgag

20

&lt;210&gt; 37

&lt;211&gt; 306

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic Kan  
target nucleotide sequence

<400> 37  
 caggggatca agatctgata aagagacagg atgaggatcg tttcgcatga ttgaacaaga 60  
 tggattgcac gcagggttctc cggccgcttg ggtggagagg ctattcggct atgactgggc 120  
 acaacagaca atcggctgct ctgatgccgc cgtgttccgg ctgtcagcgc aggggcgccc 180  
 ggttcttttt gtcaagaccg acctgtccgg tgccctgaat gaactgcagg acgaggcagc 240  
 gcggctatcg tggctggcca cgacgggctg tccttgcgca gctgtgctcg acgttgtcac 300  
 tgaagc 306

<210> 38  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(15)  
 <223> LNA monomer

<400> 38  
 gccagtcgt agccg 15

<210> 39  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> misc\_feature  
 <222> (1)..(20)  
 <223> PNA backbone

<400> 39  
 gtgccagtc ctagccgaat 20

<210> 40  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> misc\_feature

<222> (1)..(15)  
 <223> phosphorothioate linkages

<400> 40  
 gcccgagtcgt agccg

15

<210> 41  
 <211> 15  
 <212> RNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(15)  
 <223> 2'-OMe modified

<400> 41  
 gcccgagucgu agccg

15

<210> 42  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(15)  
 <223> LNA monomer

<400> 42  
 gcccgagtcgt agccg

15

<210> 43  
 <211> 13  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(13)  
 <223> LNA monomer

<400> 43

cccagtcgta gcc

13

<210> 44

<211> 478

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Hyg  
target nucleotide sequence

<400> 44

cgctgagata ggtgcctcac tgattaagca ttggtaactg tcagaccaag tttactcata 60  
tatacttttag attgatttaa aacttcattt ttaatttaaa aggatctagg tgaagatcct 120  
ttttgataat ctcattgacca aaatccctta acgtgagttt tcgttccact gagcgtcaga 180  
ccccgtagaa aagatcaaag gatcttcttg agatcctttt tttctgcgcg taatctgctg 240  
cttgcaaaca aaaaaaccac cgctaccagc ggtggtttgt ttgccggatc aagagctacc 300  
aactcttttt ccgaaggtaa ctggcttcag cagagcgcag ataccaaata ctgtccttct 360  
agtgtagccg tagttaggcc accacttcaa gaactctgta gcaccgccta catacctcgc 420  
tctgctaatac ctgttaccag tggctgctgc cagtggcgat aagtcgtgtc ttaccggg 478

<210> 45

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 45

tctgcacaat atttcaagc

19

<210> 46

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 46

aatcagcca tgtagtg

17

<210> 47

<211> 45

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 47  
cgagctatt tacccgcagg acctatccac gccctcctac atcga

45

<210> 48  
<211> 10  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<220>  
<221> modified\_base  
<222> (1)..(1)  
<223> LNA monomer

<220>  
<221> modified\_base  
<222> (3)..(7)  
<223> LNA monomer

<220>  
<221> modified\_base  
<222> (10)..(10)  
<223> LNA monomer

<400> 48  
ggatagggtcc

10

<210> 49  
<211> 12  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<220>  
<221> modified\_base  
<222> (1)..(1)  
<223> LNA monomer

<220>  
<221> modified\_base  
<222> (3)..(5)  
<223> LNA monomer

<220>  
<221> modified\_base  
<222> (7)..(9)  
<223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (11)..(12)  
 <223> LNA monomer

<400> 49  
 tggataggct ct

12

<210> 50  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(3)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (6)..(7)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (9)..(12)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (14)..(15)  
 <223> LNA monomer

<400> 50  
 gtggataggc cctgc

15

<210> 51  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(2)  
 <223> LNA monomer

<220>

<221> modified\_base  
 <222> (4)..(6)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (8)..(10)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (12)..(15)  
 <223> LNA monomer

<400> 51  
 gtggataggt cctgc

15

<210> 52  
 <211> 45  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Linker  
 oligonucleotide

<400> 52  
 ggtggagagg ctattcggct aggactgggc acaacagaca atcgg

45

<210> 53  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 53  
 gaggctattc ggctaggact gggcacaaca g

31

<210> 54  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 54  
 gaggctattc ggctacgact gggcacaaca g

31



<210> 55  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 55  
 atttaccgcg aggacctatc cacgccctcc t 31

<210> 56  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 56  
 atttaccgcg aggacgtatc cacgccctcc t 31

<210> 57  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(2)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (4)..(6)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (8)..(10)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (12)..(15)  
 <223> LNA monomer

<400> 57  
 gtggataggt cctgc 15

<210> 58  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic  
         oligonucleotide  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(2)  
 <223> LNA monomer  
  
 <220>  
 <221> modified\_base  
 <222> (4)..(6)  
 <223> LNA monomer  
  
 <220>  
 <221> modified\_base  
 <222> (8)..(10)  
 <223> LNA monomer  
  
 <220>  
 <221> modified\_base  
 <222> (12)..(15)  
 <223> LNA monomer  
  
 <400> 58  
 gtggatacgt cctgc

15

<210> 59  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic  
         oligonucleotide  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(2)  
 <223> LNA monomer  
  
 <220>  
 <221> modified\_base  
 <222> (4)..(6)  
 <223> LNA monomer  
  
 <220>  
 <221> modified\_base

<222> (8)..(10)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (12)..(15)  
 <223> LNA monomer

<400> 59  
 gtggatatgt cctgc

15

<210> 60  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 60  
 gctattcggc taggactggg cacaa

25

<210> 61  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<400> 61  
 ttgtgcccag tcctagccga atagc

25

<210> 62  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 oligonucleotide

<220>  
 <221> modified\_base  
 <222> (1)..(3)  
 <223> LNA monomer

<220>  
 <221> modified\_base  
 <222> (5)..(6)  
 <223> LNA monomer

<220>  
<221> modified\_base  
<222> (8)..(8)  
<223> LNA monomer

<220>  
<221> modified\_base  
<222> (10)..(15)  
<223> LNA monomer

<220>  
<221> modified\_base  
<222> (18)..(20)  
<223> LNA monomer

<400> 62  
gtgcccagtc gtagccgaat